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CLASSIFICATION SECRET SECURITY INFORMATION

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REPORT NO.

INFORMATION REPORT

CD NO. 25X1A

COUNTRY Czechoslovakia

DATE DISTR. 25 July 1952

SUBJECT Jachymov Uranium Mining District

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NO. OF ENCLS. (LISTED BELOW) 1 (9 pages and 4 diagrams)

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SUPPLEMENT TO REPORT NO.

The attached report (9 pages) with annexed diagrams (4 photostats) is forwarded as received for your information and retention.

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1. [redacted] Comment.

a. Paragraph 3 mentions a "large ore chamber" or "large mill" and a "small ore chamber" or "small mill". These installations are not indicated in the Annexes.

b. Paragraph 6(b) and (c) contains confusing statistics. For the period from September 1949 to May 1950, paragraph 6(b), it is stated that 200 boxes per shift, i.e. about 20 tons daily, were processed by the large mill and 100 boxes per shift, i.e. about 10 tons daily, were processed by the small mill. Since no data is given as to the weight of the boxes and the number of shifts worked, it is not known how the daily production figures were estimated. Also, the monthly production estimates, based on daily production figures, are inconsistent. In some cases the estimate appears to be based on 25 or 26 working days per month while in others it is based on almost 30 working days per month. It is not known how the breakdown as to the production amount of the specific grades was estimated.

c. Paragraph 6 (d), at page 9, states:" Assuming that about 3,000 tons of crude ore with a U_3O_8 content of 1% was processed into concentrates, the total crude ore production would be about 3,700 tons monthly and would have a U_3O_8 content of 1.5%. No statistics are shown concerning the amount of crude ore shipped to the washing plants to be concentrated. Presumably, the 700 tons added to the figure of 3,000 tons represents the amount of ore which was only crushed or shipped in bulk, including both rich and poor ore with an average U_3O_8 content of [redacted]. Therefore, it would appear that the average U_3O_8 content for the total crude ore production would be approximately 2% rather than 1.5% .

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Survey of the Jachymov (Joachimsthal) Uranium Mining District.

Eval. Report [redacted] 25X1A

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1. Previous efforts have shown that it is impossible to obtain competent information on the output of uranium crude ore from available sources. Since these sources were only assistant workers in the mines, they had a much too limited knowledge of the entire operational setup to supply useful information on the production of uranium ore. This method of producing overall production figures on uranium mining, based on many bits of information from minor sources, therefore, was not satisfactory. Another method of determining the volume of uranium ore produced was through the observation of the crude ore dressing process. This method was propitious for the Czechoslovakian uranium ore district because it was found that the total crude ore production passed through the "Central Ore Chamber" at the Bratrstvi Mine and through the three washing plants of the Bratrstvi and Elias Mines. Reports on incoming and outgoing shipments of the "Central Ore Chamber" and on amount of time worked in the washing plants, the capacities of which were well known, were sufficient to furnish a more reliable estimate of the production of the individual mines. A third method was the observation of uranium ore shipments leaving Czechoslovakia. Thus, not only the dressed crude ore but also the bulk shipments of poor crude ores were recorded. This method was made more feasible by the fact that all crude ore shipments left Czechoslovakia via Ostrov or Merklin. However, since [redacted] were 25X1
only temporarily employed in loading operations, they could gather only a partial survey on the loaded shipments. For this reason, no detailed information could be obtained by this method.

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2. No substantial changes have become known since the compilation of the last survey on the uranium ore district. The known mines of the Jachymov district together with their characteristic features are shown in the sketch in Annex 1. The information on the mine layout dates back to early 1950. The following is a chronological history of the expansion of these mines:

	Newly opened mines:	New buildings and installations	
1947:	Elias	Bratrstvi:	New ore dressing plant
	Irene		Test sheds
	Tomas		New pumping installations on the 3d, 6th and 7th levels
	Bosi Sen		Modernisation of the mining installation
1948:	Barbara	Elias:	Transformer
	Marie Antoinette		Ore chamber
	Klement		Ore bunker
	Eduard I		Washing plant
	Eva		Drying room
		Svornost:	New haulage installation with machine house. Since 1948 the Bratrstvi, Rovnost, Svornost, Elias/Irene Mines have been equipped with electrical and Diesel locomotives, and with excavators.
		Rovnost:	Modernisation of the haulage installation
1949:	Nikolai	Bratrstvi:	Transformer station
			Machine house
			Ore dump
			Office building

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Rovnost: 100-cubic meter compressor

Irene: New haulage installation

Eva: New steel hoisting tower (Stahlfoerderturm)
Machine house

1950: Adam

Eduard I: New haulage installation

Adam: New steel hoisting tower

Transformer station

3. The method of processing the crude ore was determined by piecing together bits of information supplied by sources and is illustrated by diagrams in Annexes 2, 3, and 4. The crude ore was graded as follows:

Spezial (pure pitchblende)) Rich or
Silna or bohata (rich pitchblende) also called B-material) Picked
Slaba or chuda (poor pitchblende) also called S-material) Ore
ABC-material, also called U-material (this is the poor ore)

An additional "extra rich" grade was said to have been introduced since November 1949 and was processed together with the "spezial" grade. The U_3O_8 content of the different grades was not known by sources. The large lumps of all grades of rich ore were sorted at the mines, packed in boxes, sealed and sent from all mines to the "Central Ore Chamber" (OTK) at the Bratrstvi Mine. Here it was examined in the radiometric test room and sorted according to grade. The ore was sent to the "Large Ore Chamber" or "Large Mill" for processing. Each grade was crushed separately and shoveled to obtain a uniform mixture. This mixture was then packed into metal containers and the lids sealed by welding. The "Spezial" and "Extra Rich" grades were ground only once a week or once every two weeks. The poor ore, together with sorted ore from the old waste dumps, were sorted in radiometric test stations and the rich grades of ore obtained during this sorting process were sent directly to the OTK, where it was processed in the same manner as the rich ore coming directly from the mines. The dead stone, which is earth with no uranium content, was discarded and of the remaining poor ore, part was shipped in bulk

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to Ostrov, part was sent to the "small ore chamber" or "small mill" where it was crushed and packed in metal containers and part was sent to one of the two washing plants at the Bratrstvi mine or to the washing plant at the Elias mine. In Czechoslovakia, ore was dressed only by the wet-mechanical method. No additional dressing operation is done in Czechoslovakia. After being washed, the ore was again sorted by classifying screens and vibrator tables, dried in the drying kiln and then packed into metal containers and shipped to the OTK. The three washing plants contained about 150 vibrator tables.

4. The concentrated and crushed ore processed in the OTK and also the unprocessed poor ore in bulk, was loaded once a month in Ostrov and shipped to the U.S.S.R. When there were large stocks of unprocessed poor ore, a second train with this ore in bulk was dispatched. The material processed in the Elias mine was loaded in Merklin and the cars were coupled to the train coming from Ostrov. The average number of cars reported was 45 to 50 for each train and included 10 to 12 cars of unprocessed poor ore. The remainder of the cars were loaded with iron containers of crushed ore or concentrates. The material leaving the Elias washing plant filled 5 to 8 cars. The cars were standard 15-ton to 20-ton railroad cars. Truck shipments of material to Cop (R 49/E 90), still reported early in 1949, were not observed after that time. According to information from one source, the trains taken over the Polish border could have a maximum gross weight of only 1,150 tons. This limited gross weight would mean a net weight of only 600 to 700 tons although the actual load of 50 railroad cars would be about 800 tons because most of the 20-ton railroad cars were loaded with only 17 tons, while the 15-ton cars were usually loaded to capacity. Subsequent statistics in this report are computed on a maximum net weight of 800 tons.

5. The returnees and refugees could not supply any reliable information on the U_3O_8 content of the crude ore and dressed ore. In order to obtain an estimate of the U_3O_8 content, the following factors have been assumed to be true:

   a. The main production of uranium ore in the Jachymov district is still obtained from the old mine installations, which were mined for uranium ore as early as 1919 and, in some instances, were abandoned as being unprofitable. At that time the main working zones were the uranium containing ore veins of this district, running from north to south. The information collected during earlier mining operations, on the geological conditions of this district and one the crude ore

characteristics of these veins has also proven to be applicable at the present time. The returnees confirm the belief that the previously mined veins are still the main production veins.

b. Uranium mining has been intensified under Soviet management, regardless of profitableness, since 1946. The ratio of rich ore and poor ore, the location of occurrences and the analytical findings discovered in the initial period can to some extent also serve as a rule today. In addition, poor ore material is processed on a large scale at the present time. As a result of the extensive use of poor ores the average U_3O_8 content of the mined ore and of the dressed ore will be lower than in prewar time.

c. The rich ores and poor ores have the following estimated U_3O_8 content:

"special")	40 %
" extra rich")	
"Silna"	13 %
"Slaba"	5 %

The poor ore (ABC material) has the following estimated U_3O_8 content:

1 percent for the crushed material

0.5 percent for the bulk material

The estimated U_3O_8 content of the concentrates obtained by dressing is 20 percent.

6. Estimate of the produced U_3O_8 amount. The information on the incoming shipments, the processing volume and outgoing shipments of the OTK as well as the amount of material processed by the washing plants furnish an approximate estimate of the U_3O_8 output. Figures on shipments loaded in Ostrov and Merklin can simultaneously be used for checking. Accurate information cannot be obtained because information on the incoming shipments, processing volume and outgoing shipments obtained from different sources vary considerably. The available information, covering the period from late 1949 to early 1950, is as follows:

a. Incoming shipments to the OTK

April 1949 to April 1950	450 to 550 tons per month
September 1949 to May 1950:	6 to 10 trucks daily, each loaded with 150 to 180 boxes of 30 to 40 kg each (i.e. about 45 to 55 tons daily or about 1,200 tons monthly)
Mid-1949:	Of incoming ore shipments about 5 percent were "extra rich", 75 percent were "Silna" and "Slaba" and about 20 percent were poor ore (ABC material).

b. Processing volume of the OTK (crushed ore and concentrates)

Until October 1949:	May 1949	3,000 containers of about 60 kg each i.e. about 180 tons monthly
	Summer 1949	4,000 containers of about 60 kg each i.e. about 240 tons monthly
	Autumn 1949	5,000 containers of about 60 kg each i.e. about 300 tons monthly
August 1949 to December 1949:		110 containers of about 65 kg each daily i.e. about 7 tons daily or about 200 tons monthly
September 1949 to January 1950:		200 to 240 containers of about 60 kg daily i.e. about 12 tons daily or about 350 tons monthly
April 1949 to April 1950:		5,000 to 6,000 containers of 60 to 80 kg each monthly i.e. about 350 to 420 tons monthly

Late 1949:	about 17 tons daily i.e. about 500 tons monthly
September 1949 to May 1950:	"Spezial"grade - 60 to 70 boxes of 60 kg each weekly Large mill (rich ore) 200 boxes per shift i.e.) about 20 tons daily) about 900 t Small mill (poor ore) 100 boxes per) monthly shift i.e. about 10 tons daily)
October 1949 to December 1949:	"Spezial" and "Extra rich" grades - 4 to 5 tons in fourteen days "Silna" and "Slaba" grades - 300 to 350 tons in fourteen days
Mid-1949:	Three lots totaling 300 to 350 containers of about 60 kg each were processed in 3 shifts, i.e. 18 to 20 tons daily or 540 to 600 tons monthly.
Autumn 1949:	"Silna", extra rich and "Slaba" grades - one lot, averaging 100 to 110 containers of 60 to 65 kg each, processed in 1½ shifts
Late 1949:	"Silna", extra rich and "Slaba" grades - one lot, averaging 100 to 110 containers of 60 to 65 kg each, processed in 1 shift ABC material - one lot averaging 100 to 110 containers of 60 to 65 kg each, processed in 2 shifts.

c. Outgoing shipments of the OTK.

April 1949 to April 1950:	350 tons monthly
Late 1949:	14,000 containers of 60 kg each, monthly i.e. 840 tons monthly
September 1949 to May 1950:	"Spezial" grade 100 containers of 80 kg each monthly i.e. 8 tons monthly "Silna" and "Slaba" grades 13,500 containers of 65 kg monthly i.e. 850 tons monthly

The ore dressed in the washing plants must be added to the above amounts of crushed material. With 150 vibrator tables in operation with a daily output of 30 kg per vibrator table a daily amount of 4.5 tons of concentrate is produced i.e. about 120 tons monthly of which about 80 tons are from the Elias washing plant.

d. Shipments leaving Czechoslovakia.

The reported production figures agree fairly well with the reported transportation figures. According to most reports, one transport train, loaded with processed material, was dispatched from Ostrov each month. Cars loaded with concentrate from the Elias washing plant were coupled to this train. Each train comprised 45 to 50 cars including 35 to 40 cars loaded with crushed ore and concentrates in containers and the remaining cars with shipments of poor ore in bulk. The maximum net weight of a transport train was 800 tons. This amount may be broken down into the following types of shipments:

Crushed ore		average 480 tons
Concentrate		120 "
Total material in containers	550 to 650	600 "
Poor ore in bulk	150 to 250 tons	200 "

Assuming the transport amount of about 800 tons and the U_3O_8 content as computed in paragraph 4 there would be the following U_3O_8 amount per month late in 1949:

Grades	Production amount	Percentage of U_3O_8	U_3O_8 amount
"Spezial") "Extra rich")	10 tons	40 percent	4 tons
"Silna" (40 percent) "Slaba" (60 percent)	320 tons	13 percent) 8 percent 5 percent)	25 tons
Poor ore (crushed)	150 tons	1 percent	1.5 tons
Poor ore in bulk	200 tons	0.5 percent	1 ton
Concentrates	120 tons	20 percent	24 tons
	800 tons	7 percent	55.5 tons

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Assuming that about 3,000 tons of crude ore with a U_3O_8 content of 1 percent was processed into concentrates, the total crude ore production would be about 3,700 tons monthly and would have a U_3O_8 content of 1.5 percent. This estimate seems to be too high as the crude ore of the Jachymov district has a U_3O_8 content of about 1 percent. Because of the smaller capacity of the washing plants in early 1949, it is estimated that the total 1949 production of uranium ore in Czechoslovakia would correspond to a U_3O_8 content of 300 to 350 tons. This is a considerable increase compared with the previous estimate of the 1949 U_3O_8 amount of 160 tons although the U_3O_8 content of the different grades of ore were reduced in accordance with the abovementioned presumptions. It was assumed in the earlier estimate, which was based on available reports, that the total crude ore production, except for the "spezial" grade, was being processed into concentrates in the washing plants. The estimate of the U_3O_8 amount was therefore based only on the reported capacity of the washing plants. The large shipments of crushed material had not been reported previously. Formerly, the transportation figures could not be related to production and processing figures although these statistics now agree fairly well. The U_3O_8 amounts estimated in this report are considered maximum amounts since the estimates were based on the highest figures. The estimated annual production of 300 to 350 tons of U_3O_8 would mean an increase of 15 to 17½ times the maximum prewar production of the Jachymov district which was 19.6 tons of U_3O_8 in 1932. The production reported for late 1949 was 35 times the 1932 amount. The monthly U_3O_8 content would be approximately 30 tons if the average U_3O_8 content is reduced to 1 percent and the monthly outgoing shipment to 700 tons. Thus, the actual U_3O_8 content of the ore produced in Czechoslovakia and shipped out of Czechoslovakia is probably between 30 to 55 tons monthly.

7. Two returnees indicated that other ore material which was yielded during the production of uranium ore was also collected and delivered in Jachymov. This information is the first of its kind. According to one of the returnees who worked in the Rovnost Mine, bismuth was yielded mainly in the "Schweizer"-vein on the "Daniel" level. This source, [redacted] 25X1
25X1 [redacted] stated that bismuth was as carefully as uranium ore. A large amount of bismuth, frequently more than of uranium ore, was mined especially from the summer of 1949 until the fall of 1949. It was put into the same type of containers as was the uranium ore and was also sent to the ore chamber. Source did not have any information on the subsequent processing. The other returnee worked in the Elias Mine in November 1949. According to his information,

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silver ore, if it was a rich grade, was also collected and delivered. Additional information of this kind, especially on the amount produced and the subsequent processing activities, is not available.

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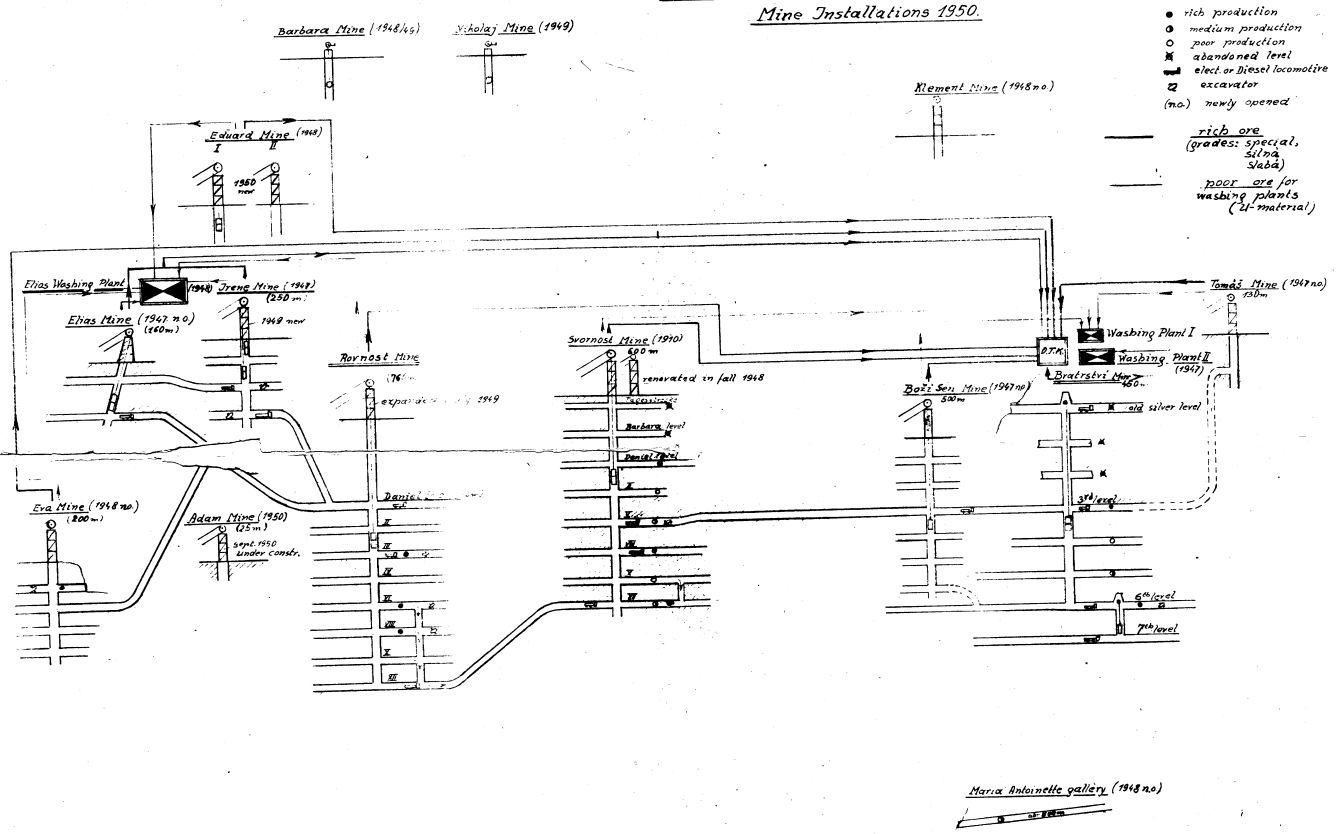
Annex

JÁCHYMOV Uranium Mining District.

Mine Installations 1950.



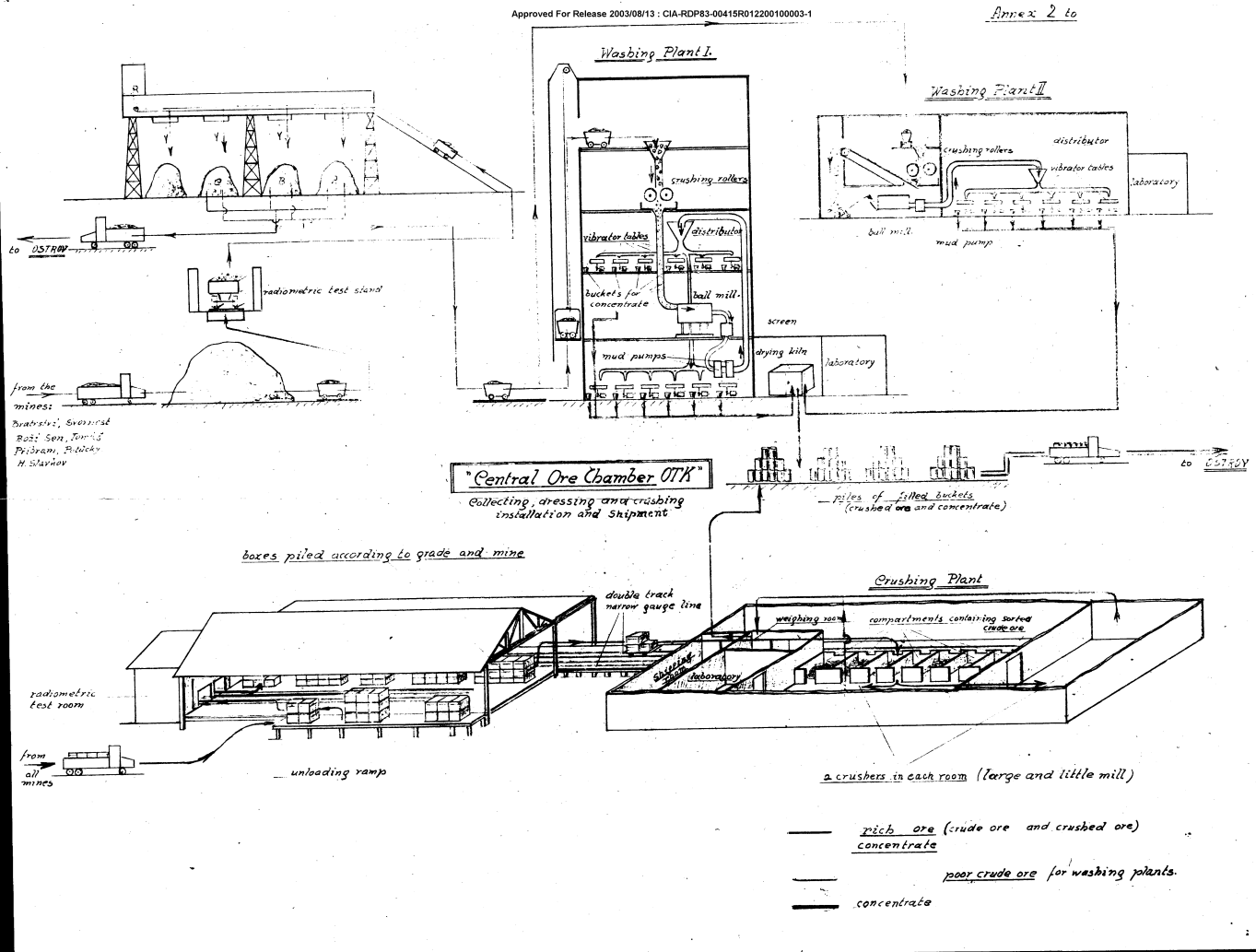
Legend:

- ● rich production
- ◑ medium production
- ○ poor production
- ⊠ abandoned level
- elect. or Diesel locomotive
- excavator
- (n.o.) newly opened

rich ore (grades: special, silná, slabá)

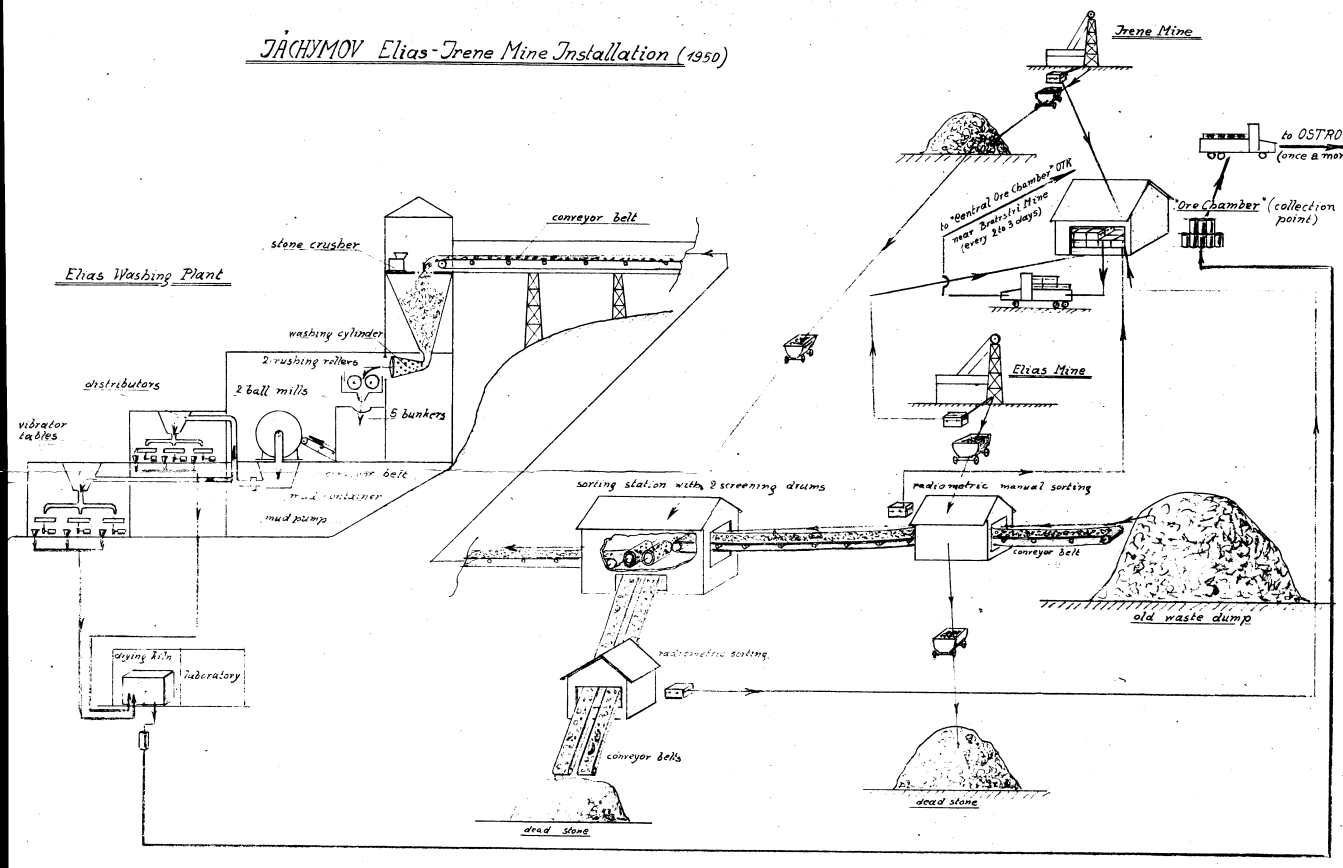
poor ore for washing plants (U-material)

Annex 2 to



Annex 3 to

JÁCHYMOV Elias-Irene Mine Installation (1950)



Annex 4 t

JÁCHYMOV Rovnost Mine. (1950)